PLACER COUNTY, CALIFORNIA
FEDERAL EMERGENCY MANAGEMENT AGENCY
COOPERATING TECHNICAL PARTNER
MAPPING ACTIVITY STATEMENT
TASK 1

Task #1 – Digital Topographic, Base Map and Cross Section Data Development

In accordance with the Cooperating Technical Partner (CTP) Memorandum of Agreement (MOA) dated Sept. 30, 2001 between Placer County and the Federal Emergency Management Agency (FEMA), Task #1 is as follows:

1. **Objective and Scope:** The objective of this Agreement is to develop digital base maps, digital topographic, and digital cross section data for Placer and Sacramento Counties on a reach of Linda Creek. Linda Creek meanders through both counties. Also studied will be a portion of Pleasant Grove Creek in Placer County. The digital base maps and topographic data will be used for hydraulic modeling and floodplain mapping to produce Flood Insurance Rate Maps in digital form for the following entities: Placer County, Placer County Flood Control and Water Conservation District, City of Roseville, and Sacramento County.

2. **Period of Performance:** This Mapping Activity will begin September 30, 2001 and end no later than September 30, 2003. This Mapping Activity may be terminated at the option of FEMA or Placer County in accordance with the provisions of the Sept. 30, 2001 CTP Memorandum of Agreement.

4. **Standards:** The following standards and documents are relevant to this Mapping Activity:
   A. Survey Methodology –
      - Global Positioning System (GPS) Surveys: Follow National Geodetic Survey (NGS) – 58, "Guidelines for Establishing GPS – Derived Ellipsoid Heights (Standard: 2 cm and 5 cm)," November, 1997.
      - Aerial Surveys: Follow EM 1000-1000, "Photogrammetric Mapping," March 31, 1993.
      - Conventional Surveys: Follow standard American Congress on Surveying and Mapping (ACSM) procedures.
      - Hydro Surveys: Follow EM 1110-2-1003, "Hydrographic Surveys," October 31, 1994.

B. Draft LIDAR specifications are available on FEMA 's web site at www.fema.gov/mit/tsd/MM lidar.htm.

C. Guidelines and Specifications for Study Contractors (FEMA 37) available via the internet at http://www.fema.gov/mit/tsd/EN reg.htm.

D. Digital mapping submissions will comply with the requirements of Chapter 9 and Appendix 7 of FEMA 37.

E. Base Map Standards for DFIRMs (FEMA). This document provides minimum base map standards for DFIRMs. These include the following requirements for DFIRM base map data:
   - Cover the community(s) or county(s) completely;
   - Be distributable by FEMA to the public;
   - Meet the minimum accuracy requirements outlined in the document;
   - Include all required features.

F. Standards for Digital Orthophotos (U.S. Geological Survey, National Mapping Program, December, 1996).

G. Content Standards for Digital Geospatial Metadata (Federal Geographic Data Committee, 1998).

H. Digital Flood Insurance Rate Map (DFIRM) Specifications.

5. **Products:** Placer County shall make the following products available:

   - TIN data on CD-ROM.
   - Hardcopy topographic maps.
   - Report summarizing methodology and results.
   - Completed form number 5 of Revisions to National Flood Insurance Program Maps, Application/Certification Forms and Instructions (MT-2).
   - Checkpoint analyses to assess the accuracy of TIN data including Root Mean Square Error (RMSE) calculations to support vertical accuracy.
   - Identification of remote sensing data voids and methods used to supplement data voids.
   - NGS data sheets for Network Control Points (NCP) used to control remote sensing and ground surveys.
   - Cross section data supplied in both paper and digital format. Digital data shall be furnished on CD as text files. The data shall be formatted according to the standard HEC-RAS input. Cross section locations and end points to be coordinated and specified by the FEMA Study Contractor. Cross sections include both open water cross section and bridge crossing information.
   - Digital base map files in one of the GIS file formats specified in FEMA's Base Map Standards for DFIRMs.

- Database files for the layers included in the digital base map in one of the database formats specified in FEMAs Digital Flood Insurance Rate Map (DFIRM) Specifications. These files should also be provided on CD-ROM.
- A completed Checklist Template provided by FEMA. This checklist will contain basic information about the base map data.
- Metadata files describing the digital base map data will be provided. These files will include the required information and follow the examples shown in FEMAs Digital Flood Insurance Rate Map (DFIRM) Specifications.
- Certification that the base map data meet FEMAs minimum standards and specifications.

6. **Schedule and Milestones:**

Milestone1: upon completion, products for the first milestone will be provided to the FEMA Project Officer. These include:

- Documentation of methodology, data analyses, date of survey/data collection, NCP, and other relevant information.
- Work plan for supplementing data voids caused by limitations of remote sensing and/or source of any supplementary data collection.
- The first milestone should be completed within the first three months of this activity.

Milestone 2 (Final Products): Upon completion, final products for the first milestone will be provided to the FEMA Project Officer. These include:

- TIN data on CD-ROM.
- Hardcopy topographic maps.
- Report summarizing methodology and results.
- Completed form number 5 of Revisions to National Flood Insurance Program Maps, Application/Certification Forms and Instructions (MT-2).
- Checkpoint analyses to assess the accuracy of TIN data including Root Mean Square Error (RMSE) calculations to support vertical accuracy.
- Identification of remote sensing data voids and methods used to supplement data voids.
- NGS data sheets for Network Control Points (NCP) used to control remote sensing and ground surveys.
- Cross section information.
- The second milestone should be completed within the second three months of the activity, weather permitting.

Final products will be made available in accordance with the Period of Performance described in Section 2 of this Mapping Activity Statement.

7. **Certification:** The following certifications apply to this Mapping Activity (as appropriate):

- Registered professional engineer or licensed land surveyor, will certify topographic information, in accordance with **44** CFR 65.5©.
- Certification by the American Society for Photogrammetry and Remote Sensing (ASPRS) is also acceptable.
- The digital base map data will be accompanied by certification that the digital map data meet FEMAs minimum standards and specifications. In addition, the metadata files will include a description of the horizontal and vertical accuracy of the digital base map information.

8. **Technical Assistance and Resources:** Placer County may request support from FEMAs Project Officer or the Region's Study Contractor in setting up control networks, assessing TIN data accuracy, and merging ground surveys with remote sensing to fill data voids.

9. **Subcontractors:** Specify the type of subcontractors to be used for this activity.

10. **Quality Assurance/Quality Control (QA/QC) Procedures:** The QNQC procedures outlined in Chapter 10 and Appendix **4** (currently being revised) of FEMA 37 should be followed during the development of topographic data for hydrologic and hydraulic modeling and floodplain mapping. The data should be independently reviewed for compliance with the standards defined in Section **4** of this Mapping Activity Statement. This independent review will be conducted by the FEMA Study Contractor.

    FEMA encourages its CTC partners to perform internal QA/QC on their digital base map data before sharing this data with FEMA. Examples of recommended QNQC review items include the following:
    - Complete data capture of base map features.
    - Horizontal and vertical accuracy.
    - Topological fidelity of vector files. This includes reviews for overshoots or dangles, gaps, node errors, label errors, pseudo nodes, and closed area features.
    - Edgematching.
    - Complete data capture of all appropriate spatial database attributes. Logical data encoding checks should be performed to assure consistency within the base map database.

11. **Reporting:** Quarterly coordination meetings shall be scheduled to ensure coordination and compatibility with hydrologic & hydraulic models used by the FEMA Study Contractor.

12. **Points of Contact:** The FEMA Project Officer is Les Sakumoto, P.E. and the CTP's Project Manager is Mike Foster, P.E., Placer County.

Each party has caused this Mapping Activity Statement to be executed by its duly authorized representatives.

Placer County Representative — Date: 9-19-01

FEMA authorized representative — Date: 9-30-01

Approved as to form:

County Counsel

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